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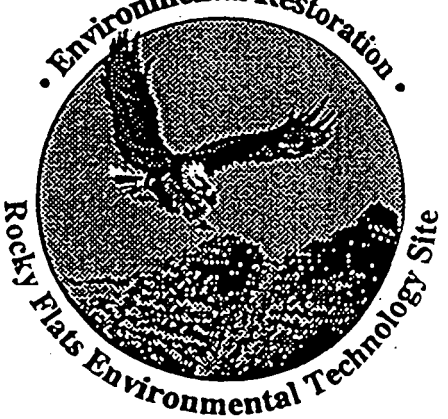
COMPANY

Environmental Restoration
RFCA Standard Operating Protocol
for Routine Soil Remediation
FY04 Notification #04-11
IHSS Group NE-1 (Ponds B-1, B-2, and B-3)



October 2004

1/49

Environmental Restoration
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October 2004

2

Environmental Restoration
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Approval received from the U.S. Environmental Protection Agency

( ).

Approval letter contained in the Administrative Record.

October 2004

3

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ATTACHMENTS

4

ACRONYMS

AAESE	Accelerated Action Ecological Screening Evaluation
AL	action level
Am	americium
BMP	best management practice
BO	Biological Opinion
BZ	Buffer Zone
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
CWA	Clean Water Act
cy	cubic yard
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
EDDIE	Environmental Data Dynamic Information Exchange
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
FY	Fiscal Year
IA	Industrial Area
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
IMP	Integrated Monitoring Plan
K-H	Kaiser-Hill Company, L.L.C.
MCL	maximum contaminant level
MDL	method detection limit
nCi/g	nanocuries per gram
NFAA	No Further Accelerated Action
OU	Operable Unit
OPWL	Original Process Waste Line
PAC	Potential Area of Concern
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
pCi/L	picocuries per liter
PCOC	potential contaminant of concern
PDF	Portable Document Format
POC	Point of Compliance
POE	Point of Evaluation
Pu	plutonium
RAO	remedial action objective
RCRA	Resource Conservation and Reclamation Act
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RL	reporting limit

5

RSOP	RFCA Standard Operating Protocol
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
UBC	Under Building Contamination
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WRW	wildlife refuge worker

1.0 INTRODUCTION

This Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003a) Notification includes the notification to remediate Individual Hazardous Substance Sites (IHSSs), at the Rocky Flats Environmental Technology Site (RFETS or Site) Buffer Zone (BZ) during Fiscal Year (FY) 2004 (04). The purpose of this Notification is to invoke the ER RSOP for Ponds B-1, B-2, and B-3 in IHSS Group NE-1. Activities specified in the ER RSOP are not reiterated here; however, deviations from the ER RSOP are included where appropriate.

Sediment and soil with contaminant concentrations greater than RFCA wildlife refuge worker (WRW) action levels (ALs), or as indicated by the Subsurface Soil Risk Screen (SSRS), and associated debris will be removed in accordance with RFCA (DOE et al. 2003) and the ER RSOP (DOE 2003a). Ecological effects will be evaluated in the Accelerated Action Ecological Screening Evaluation (AAESE) and the ecological risk assessment portion of the sitewide Comprehensive Risk Assessment (CRA).

IHSS Group NE-1 consists of the Walnut Creek and Woman Creek A-, B-, and C-Series retention ponds, as shown on Figure 1. The proposed remediation sites covered under ER RSOP Notification #04-11 are listed in Table 1.

Table 1
Potential Remediation Areas for IHSS Group NE-1

IHSS Group	IHSS	PCOCs	Media	Estimated Remediation Volume (in place)
NE-1	Pond B-1 (IHSS 142.5) Pond B-2 (IHSS 142.6) Pond B-3 (IHSS 142.7)	Metals PCBs Radionuclides SVOCs VOCs	Soil and Sediment	7,000 cy

2.0 IHSS GROUP NE-1

IHSS Group NE-1 (Figure 1) contains the A-, B-, and C-Series ponds. This ER RSOP Notification addresses only Ponds B-1, B-2, and B-3, as shown on Figure 2. The remaining ponds not addressed in this Notification, Ponds A-1 through A-4, B-3 and B-4, and C-2, are currently being evaluated by the DOE to determine the path-forward for these areas. Pond C-1 received a No Further Accelerated Action (NFAA) on June 17, 2004.

2.1 PCOCs

Potential contaminants of concern (PCOCs) at IHSS Group NE-1 (Ponds B-1, B-2, and B-3) are listed in Table 1. The PCOCs were determined based on process knowledge and data collected during previous studies (DOE 1992, 1996, 1997).

Figure 1

IHSS Group NE-1
A, B, and C-Series Ponds
Location Map

2084000 2086000 2088000 2090000 2092000 2094000

754000 752000 750000 748000

No Name Gulch

North Walnut Creek

Walnut Creek

Indiana Pond

GS03

A-Ponds

142.4

142.3

142.2

142.1

South Walnut Creek

GS08

142.9

B-Ponds

142.8

142.7

142.6

GS10

Badger Gulch

Kestrel Gulch

C-Ponds

Woman Creek

142.10

142.11

Arnica Draw

Mower Ditch

KEY

- Proposed remediation area (Ponds B-1, B-2, and B-3)
- IHSS location (Pond)
- Building/structure
- Demolished structure
- Paved area
- Dirt road
- Stream, ditch, or other drainage feature
- Surface water Point of Evaluation (POE) station
- Surface water Point of Compliance (POC) station

N W E S

400 0 400 800 Feet

Scale = 1:10,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: RADMS

Prepared for: KAISER•HILL COMPANY

w:\\projects\2004\NE-1\Characterization\
ne-1char 01-27-04 gpp.apr October 2004

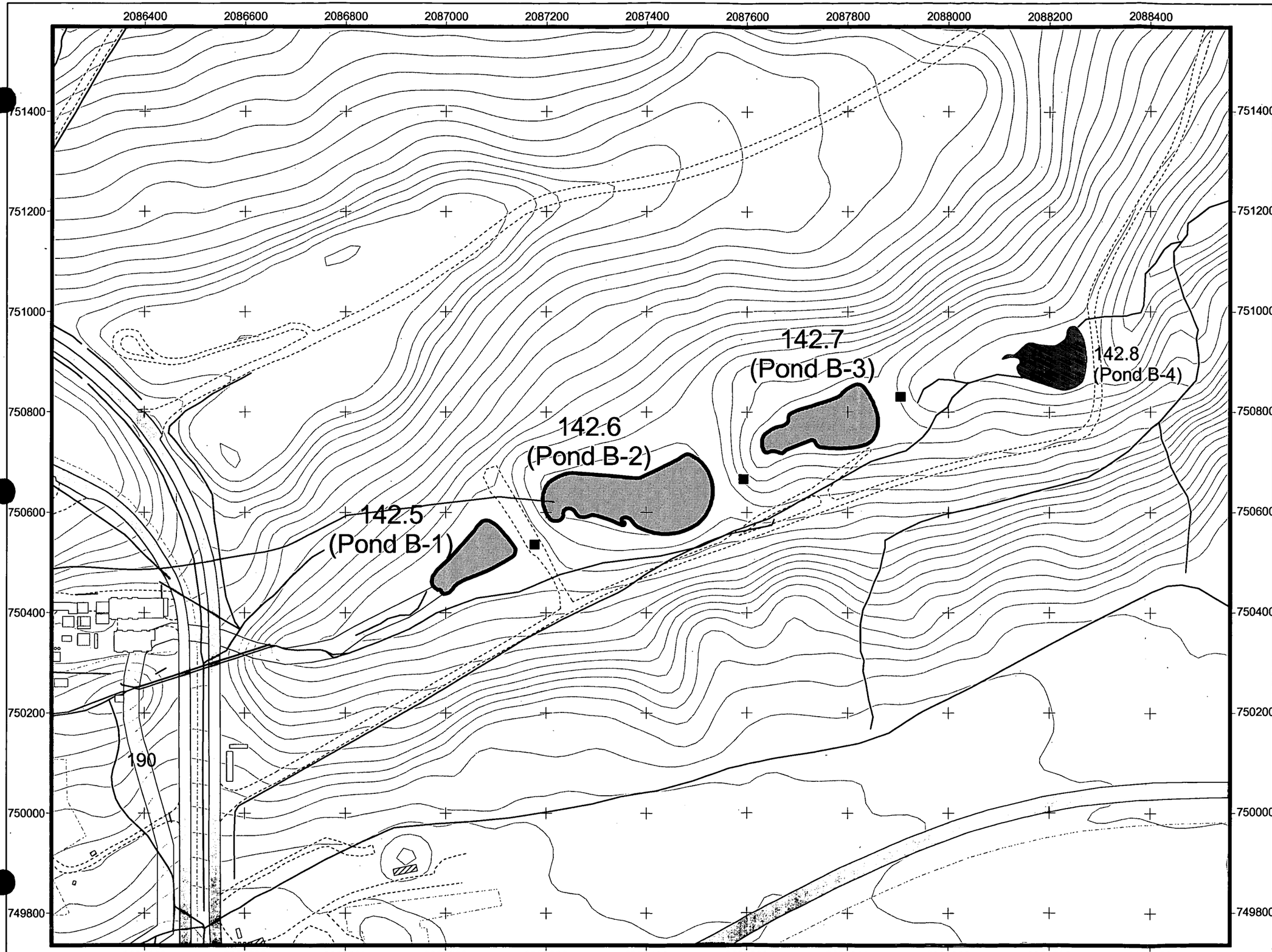

Figure 2

IHSS Group NE-1 (Ponds B-1, B-2, and B-3) Potential Remediation Areas

KEY

- Proposed remediation area (Ponds B-1, B-2, and B-3)
- IHSS location (Pond)
- IHSS location
- Building/structure
- Paved area
- Topography (5-ft contour interval)
- Dirt road
- Stream, ditch, or other drainage feature
- OPWL location (removed)
- OPWL location
- OPWL location (planned to be removed)
- Approximate location of air sampler

N W E S

100 0 100 200 Feet

Scale = 1:2,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: RADMS

Prepared for: KAISER•HILL COMPANY

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ne-1char 01-27-04 gpp.apr October 2004

2.2 Project Conditions

The following conditions are present within the IHSS Group NE-1, Ponds B-1, B-2, and B-3 area:

- The general types of materials that have been routinely released to the B-Series drainage during the history of RFETS include the following: treated sanitary effluent, treated and untreated process waste, treated and untreated decontamination laundry wastewater, cooling tower blowdown, footing drain flows, and stormwater runoff.
- Ponds B-1 and B-2 are "offline," i.e., isolated from the South Walnut Creek drainage, except during emergency events when water can be diverted to these ponds. Pond B-3 receives discharges of treated water from the Site's Wastewater Treatment Plant.
- Sediment samples collected from Ponds B-1, B-2, and B-3 and nearby areas indicate the presence of americium-241 and plutonium-239/240 at activities greater than the WRW ALs (Figure 3).
- Soil samples collected from the B-Series ponds and nearby areas indicate one location (CW46-001) contains americium-241 and plutonium-239/240 at activities greater than the WRW ALs (Figure 4).
- None of the remaining PCOCs (metals, polychlorinated biphenyls [PCBs], semivolatile organic compounds [SVOCs], and volatile organic compounds [VOCs]) were detected in sediments or soil at levels above the WRW ALs. However, these contaminants were detected above background means plus two standard deviations and will be included in the analysis of confirmation soil and sediment samples.
- Sediment thickness measurements in the B-Series ponds indicate an average of 2- to 3-feet thick. Isolated pockets of thicker sediment may exist.
- The "Pond B-1 Dam Hot Spot" is located on the east side of the dam near the Original Process Waste Line (OPWL) discharge point. The OPWL has been removed from this area.
- Groundwater elevations may have risen in recent months due to precipitation events.

2.3 RFCA Subsurface Soil Risk Screen Evaluation

An SSRS is performed when nonradionuclides and uranium are present in soil 6 inches below the ground surface, or when americium-241 and plutonium-239/240 are present below 3 feet from the ground surface. Current site conditions were evaluated using available data to determine whether remediation is required by the SSRS. The SSRS will be conducted again after the accelerated action and related confirmation sampling tasks are completed. The accelerated actions taken, confirmation results, and a revised SSRS will be documented in the IHSS Group NE-1, Ponds B-1, B-2, and B-3 Closeout Report.

Screen 1 – Are contaminant of concern (COC) concentrations below RFCA Table 3 soil ALs for the WRW?

No. Existing sediment and surface soil data indicate contaminant concentrations exceed RFCA WRW ALs. In sediment, the maximum reported plutonium-239/240 activity was

10

THIS TARGET SHEET REPRESENTS AN OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 04-RF-01102; KLW-033-04)

Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification 04-11 IHSS Group NE-1 (Ponds B-1, B-2, B-3)

October, 2004

Figure 3:

IHSS Group NE-1 Ponds B-1, B-2, and B-3 Existing Sediment Sampling Results Greater than MDLs/RLs or Background Means Plus Two Standard Deviations

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October, 2004

CERCLA Administrative Record Document, BZ-A-000747

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

2085000 2086000 2087000 2088000 2089000

752000 751000 750000 749000

Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
CW48-001	Aluminum	0.00	0.50	22000.000	9.200	18902.000	228000.000	mg/kg
CW48-001	Americium-241	0.00	0.50	18.580	0.150	0.823	76.000	pCi/g
CW48-001	Antimony	0.00	0.50	0.650	0.470	1.470	408.000	mg/kg
CW48-001	Barium	0.00	0.50	280.000	0.690	141.260	26400.000	mg/kg
CW48-001	Beryllium	0.00	0.50	1.300	0.150	0.966	921.000	mg/kg
CW48-001	Chromium	0.00	0.50	23.000	0.290	16.990	266.000	mg/kg
CW48-001	Copper	0.00	0.50	27.000	0.580	18.060	41000.000	mg/kg
CW48-001	Ethylbenzene	0.00	0.50	158.000	48.500		4250000.000	ug/kg
CW48-001	Iron	0.00	0.50	20000.000	2.700	18037.000	307000.000	mg/kg
CW48-001	Lithium	0.00	0.50	18.000	0.920	11.250	20400.000	mg/kg
CW48-001	Manganese	0.00	0.50	580.000	0.330	365.080	6480.000	mg/kg
CW48-001	Nickel	0.00	0.50	17.000	0.370	14.910	20400.000	mg/kg
CW48-001	Plutonium-239/240	0.00	0.50	104.082	1.102	0.066	50.000	pCi/g
CW48-001	Strontium	0.00	0.50	280.000	0.110	48.940	613000.000	mg/kg
CW48-001	Toluene	0.00	0.50	1960.000	1050.000		1130000.000	ug/kg
CW48-001	Uranium, Total	0.00	0.50	33.531	9.356	5.980	2750.000	mg/kg
CW48-001	Uranium-234	0.00	0.50	11.290	3.150	2.753	300.000	pCi/g
CW48-001	Uranium-235	0.00	0.50	0.450	0.279	0.663	8.000	pCi/g
CW48-001	Uranium-238	0.00	0.50	11.290	3.150	2.000	351.000	pCi/g
CW48-001	Vanadium	0.00	0.50	48.000	0.880	45.590	7150.000	mg/kg
CW48-001	Xylene	0.00	0.50	1200.000	97.100		2040000.000	ug/kg
CW48-001	Zinc	0.00	0.50	170.000	0.660	73.760	307000.000	mg/kg
CW48-001	Americium-241	0.50	1.50	240.500	3.103	0.020	76.000	pCi/g
CW48-001	Cadmium	0.50	1.50	2.700	0.100	1.700	982.000	mg/kg
CW48-001	Copper	0.50	1.50	130.000	0.070	38.210	41000.000	mg/kg
CW48-001	Lead	0.50	1.50	45.000	0.420	24.670	1000.000	mg/kg
CW48-001	Plutonium-239/240	0.50	1.50	1370.650	3.103	0.020	50.000	pCi/g
CW48-001	Uranium, Total	0.50	1.50	99.588	6.831	3.040	2750.000	mg/kg
CW48-001	Uranium-234	0.50	1.50	24.950	4.021	2.640	300.000	pCi/g
CW48-001	Uranium-235	0.50	1.50	0.773	0.294	0.120	8.000	pCi/g
CW48-001	Uranium-238	0.50	1.50	30.500	2.200	1.490	351.000	pCi/g
CW48-001	Zinc	0.50	1.50	160.000	0.700	139.100	307000.000	mg/kg

Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
PT064	Americium-241	0.00	0.02	0.286	0.018	0.023	76.000	pCi/g
PT064	Plutonium-239/240	0.00	0.02	0.835	0.018	0.068	50.000	pCi/g
PT064	Aluminum	0.00	0.17	16700.000	3.000	16902.000	228000.000	mg/kg
PT064	Americium-241	0.00	0.17	0.270	0.004	0.023	76.000	pCi/g
PT064	Barium	0.00	0.17	164.000	20.000	141.260	26400.000	mg/kg
PT064	Chromium	0.00	0.17	16.900	2.000	16.990	266.000	mg/kg

Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
CV48-000	Uranium, Total	13.50	14.50	10.704	4.748	3.040	2750.000	mg/kg
CV48-000	Uranium-234	13.50	14.50	3.904	1.598	2.640	300.000	pCi/g
CV48-000	Uranium-235	13.50	14.50	0.107	0.123	0.120	8.000	pCi/g
CV48-000	Uranium-238	13.50	14.50	3.804	1.598	1.490	351.000	pCi/g

Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
CW48-000	Aluminum	0.00	0.50	24000.000	7.500	16902.000	228000.000	mg/kg
CW48-000	Americium-241	0.00	0.50	4.629	0.580	0.023	76.000	pCi/g
CW48-000	Barium	0.00	0.50	270.000	0.570	141.260	26400.000	mg/kg
CW48-000	Beryllium	0.00	0.50	1.200	0.180	0.966	921.000	mg/kg
CW48-000	Chromium	0.00	0.50	27.000	0.230	16.990	266.000	mg/kg
CW48-000	Copper	0.00	0.50	50.000	0.720	18.060	41000.000	mg/kg
CW48-000	Iron	0.00	0.50	24000.000	2.400	18037.000	307000.000	mg/kg
CW48-000	Lithium	0.00	0.50	15.000	0.750	11.250	20400.000	mg/kg
CW48-000	Nickel	0.00	0.50	19.000	0.300	14.910	20400.000	mg/kg
CW48-000	Plutonium-239/240	0.00	0.50	28.382	0.580	0.066	50.000	pCi/g
CW48-000	Strontium	0.00	0.50	150.000	0.090	48.940	613000.000	mg/kg
CW48-000	Vanadium	0.00	0.50	91.000	0.720	45.590	7150.000	mg/kg
CW48-000	Zinc	0.00	0.50	110.000	0.700	73.760	307000.000	mg/kg
CW48-000	Americium-241	0.50	2.50	0.712	0.509	0.020	76.000	pCi/g
CW48-000	Plutonium-239/240	0.50	2.50	49.658	0.509	0.020	50.000	pCi/g
CW48-000	Uranium, Total	0.50	2.50	0.899	14.029	3.040	2750.000	mg/kg
CW48-000	Uranium-238	0.50	2.50	0.323	1.357	1.490	351.000	pCi/g

Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
CV48-000	Aluminum	0.00	0.50	17000.000	5.000	18902.000	228000.000	mg/kg
CV48-000	Chromium	0.00	0.50	17.000	0.190	16.990	266.000	mg/kg
CV48-000	Lithium	0.00	0.50	12.000	0.500	11.250	20400.000	mg/kg
CV48-000	Strontium	0.00	0.50	55.000	0.061	48.940	613000.000	mg/kg
CV48-000	Uranium, Total	8.50	10.50	8.910	3.805	3.040	2750.000	mg/kg
CV48-000	Uranium-234	8.50	10.50	3.000	1.281	2.640	300.000	pCi/g
CV48-000	Uranium-235	8.50	10.50	0.192	0.124	0.120	8.000	pCi/g
CV48-000	Uranium-238	8.50	10.50	3.000	1.281	1.490	351.000	pCi/g

Pond B-1
Pond B-2
Pond B-3
Pond B-4
Pond B-5

12

Figure 4

IHSS Group NE-1
B-Ponds Existing Surface and Subsurface Soil Results Greater than MDLs/RLs or Background Means Plus Two Standard Deviations

Key

- Detected Above WRW Action Level
- Detected Below Action Level
- Below Background or MDL/RL
- Demolished Structure
- Structure
- Asphalt
- Dirt Road
- Lake
- Stream

N W E S

200 0 200 400 Feet

Scale = 1:5,500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: RADMS Date: October 2004

Prepared for: KAISER•HILL COMPANY

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939.4 picocuries per gram (pCi/g) at a depth of 0.0 to 0.5 feet. In surface soil (0 to 3 feet), the maximum plutonium-239/240 activity was 1,370.85 pCi/g.

Screen 2 – Is there a potential for subsurface soil to become surface soil (landslide and erosion areas identified on Figure 1)?

Yes. IHSS Group NE-1, Ponds B-1, B-2, and B-3 are located in an area subject to erosion and landslides in accordance with Figure 1 of RFCA (DOE et al. 2003). Under the current site conditions, erosion from storm events or flooding is a possible mechanism whereby subsurface soil could become surface soil or impact surface water in the B-Series ponds area.

Screen 3 – Does subsurface soil contamination for radionuclides exceed criteria defined in Section 5.3 and Attachment 14?

No. Limited subsurface soil data for IHSS Group NE-1 (samples CV46-000 and CV46-001 shown of Figure 4) indicate no exceedances of RFCA WRW ALs below 3 feet.

Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause an exceedance of the surface water standards?

Yes. Contaminant migration via erosion from a significant storm event or flooding is a possible pathway whereby surface water could be affected by the B-Series ponds sediment and soil. In general, many of the IHSSs within the Industrial Area (IA) that are a source of groundwater contamination are also potential sources for historical or current contamination in Ponds B-1, B-2, and B-3. Although radionuclides are the only analytes to exceed WRW ALs, all PCOCs listed on Table 1 will be analyzed during confirmation sampling of the B-Series ponds.

The nearest RFCA surface water Points of Evaluation (POEs) are GS10, located upstream of Pond B-1, and GS08, located downstream of Pond B-5. Both of these POEs have had reported radionuclide activities greater than water quality ALs. The 100, 300, 400, 500, 600, 700, 800, and 900 Areas all contribute flow to GS10 (DOE 2003b). Any groundwater encountered will be managed independently through collection and analysis prior to final disposition.

2.4 Remediation Plan

In accordance with RFCA, Paragraph 16, remedial actions are exempt from the administrative requirement to obtain federal or state permits, in this case a Clean Water Act (CWA) Section 404 permit; however, the substantive requirements of such permits must be met. Sediment removal activities, as described in this Notification, will include proper maintenance, control of soil erosion, protection of water quality, and minimization of impacts to wildlife species. The proposed actions will result in temporary impacts to the wetlands in this area. Approximately 2.6 acres of open water and emergent wetlands have been identified (based on high water areas) near the ponds. Following remediation activities, the ponds and wetlands will be restored. Therefore, the change in inventory resulting from this action should be minimal.

The RSOP Notification remediation plan for IHSS Group NE-1, Ponds B-1, B-2, and B-3 includes the following objectives:

13

- Conduct work according to the following general sequence of events:
  - Build water diversion ditches around each pond to minimize run-on.
  - Dewater the ponds.
    a) Pond B-1 will be pumped into Pond B-2.
    b) Pond B-2 will be pumped into Pond A-2.
    c) Pond B-3 will be pumped into Pond A-2 after Building 995 is closed.
  - Mix Pond B-1 sediment with portland cement to remove free water.
  - Excavate the de-watered sediment in Pond B-1 and place directly into waste containers for off-site disposal.
  - Perform confirmation sampling.
  - Repeat mixing of portland cement, excavation, direct loading into containers for offsite disposal, and confirmation sampling for Ponds B-2 and B-3.
  - Recontour ponds to a safe configuration.
  - Revegetate the area by using native plant species and by integrating applicable phytoremediation methods described in the Ground Water Interim Measure/Interim Remedial Action (IM/IRA) report.

- Remove free water in the sediments before excavation using a product of finely ground portland cement clinker mixed with a small amount of gypsum (calcium sulfate dihydrate). The portland cement clinker is made by heating to a high temperature a mixture of substances such as limestone, sand, clay and shale. Portland cement is essentially hydraulic calcium silicates contained in a crystalline mass, not separable into individual components. Major compounds in portland cement consist of the following:
  - tricalcium silicate (3CaO•SiO2) CAS #12168-85-3;
  - dicalcium silicate (2CaO•SiO2) CAS #10034-77-2;
  - tricalcium aluminate (3CaO•Al2O3) CAS #12042-78-3;
  - tetracalcium aluminoferrite (4CaO•Al2O3•Fe2O3) CAS #12068-35-8; and
  - calcium sulfate dihydrate (gypsum) (CaSO4•2H2O) CAS #7778-18-9.

- Sediment will be removed laterally to the average water mark or until confirmation sampling indicates no further sediment or soil removal is necessary in accordance with RFCA. Proposed statistical and biased sampling locations are shown on Figure 5. The proposed statistical sampling locations are based on a 36-foot grid spacing over the area of the pond. Additional biased sampling locations are located beyond the perimeter of the pond and dam areas.

- Remove sediment and soil with plutonium-239/240 or americium-241 activities greater than the RFCA WRW ALs. If activities are greater than WRW ALs below 3 feet from the top of the sediment, conduct an SSRS. Sediment in Ponds B-1, B-2, and B-3 is approximately 2- to 3-feet thick, although some areas may be thicker. All sediment will be removed from Ponds B-1, B-2, and B-3 and confirmation samples will be collected and analyzed for all PCOCs (metals, radionuclides, PCBs, SVOCs,

14

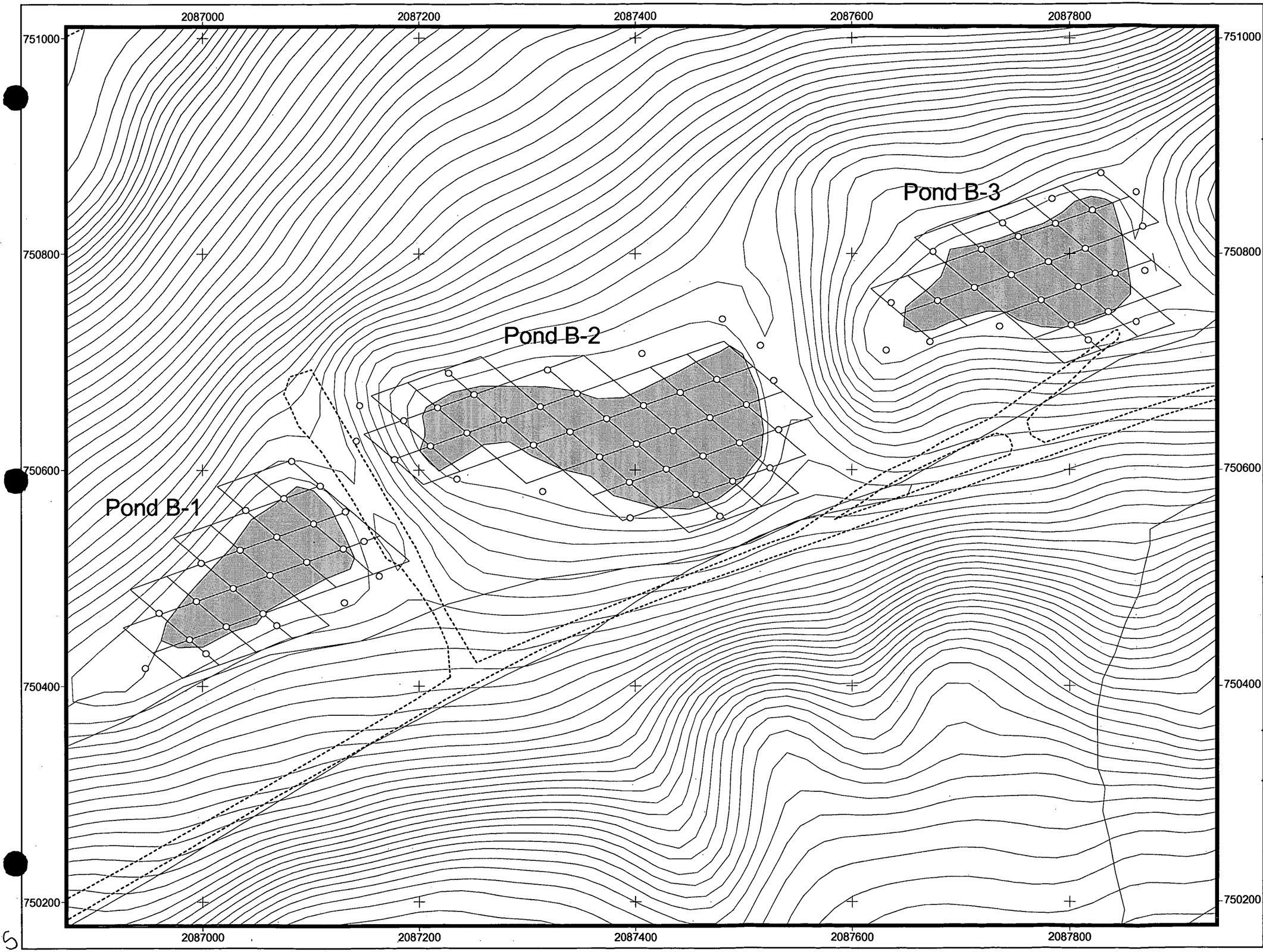

Figure 5

IHSS Group NE-1
Ponds B-1, B-2, and B-3
Proposed Confirmation
Sampling Locations

Key

- Potential Statistical Confirmation Sampling Location
- Potential Biased Confirmation Sampling Location
- Statistical Sampling Grid
- Demolished Structure
- Structure
- Asphalt
- Dirt Road
- Lake
- Stream
- Topography (2-ft interval)

N
W E
S

50 0 50 Feet

Scale = 1 : 1,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Date: October 2004

RADMS

Prepared for:

KAISER•HILL COMPANY

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15

and VOCs) from soil below the sediment. Confirmation samples will be collected from the first 6-inch interval below the excavation surface.

- Remove soil from the "Pond B-1 Dam Hot Spot" as shown on Figure 4 (sample CW46-001). Collection of confirmation samples near the dam and riprap areas will be coordinated in consultation with the State Engineers Office.

Although this Notification addresses only soil and sediment removal from Ponds B-1, B-2, and B-3, additional considerations, including the following, will be taken into account:

- Pond A-2 will be used to contain water from Ponds B-1, B-2, and B-3. This process is part of the approved B-Pond operation plan. Water is typically only pumped down to a level that prohibits any sediment contamination of the water. Pond A-2 has historically shown no contamination from this water management operation.
- A Biological Evaluation (Attachment 1) was prepared that describes impacts to endangered species and wetlands associated with the B-Series ponds. The Biological Evaluation is being discussed with the U.S. Environmental Protection Agency (EPA).
- A Programmatic Biological Assessment was written to address threatened and endangered species issues (with particular regard to the Preble's mouse) for closure projects at RFETS. The B-Series ponds remediation activities were included in this document. A Biological Opinion (BO) has been received from the U.S. Fish and Wildlife Service (USFWS) giving approval for the project along with specific requirements that must be employed during the project activities (i.e., BMPs, activity specific measures, terms and conditions; see Appendix A of Attachment 1 for the BO).
- Build water diversion ditches around each pond to minimize run-on These diversion ditches will be constructed within the allowed footprint of the project and are described in greater detail in the BE in Attachment 1.
- Fill material will only be placed in the ponds after remediation to leave the project area in a safe condition. This may include filling isolated excavation potholes, and surface water control ditches, and providing slope stability.
- Effluent discharge from Building 995 will be directed to Pond B-3 until the building is decommissioned in October 2004 and all the remaining effluent is discharged. Sediment removal will commence in Pond B-3 after effluent discharge has ceased.

It is anticipated that after remediation there may be areas with concentrations of metals, radionuclides, and organics greater than background means plus two standard deviations or reporting limits (RLs), but below RFCA ALs.

2.5 Stewardship Evaluation

Based on the PCOCs (Table 1) and the ER RSOP (DOE 2003a), it is anticipated that all contamination above RFCA ALs will be remediated. Figure 2 shows the potential remediation areas.

16

An additional stewardship evaluation will be conducted during remediation using the consultative process and documented in a Closeout Report for IHSS Group NE-1 (Ponds B-1, B-2, and B-3). A new map of residual contamination will be generated after remediation. The following sections present the stewardship evaluation.

2.5.1 Proximity to Other Contaminant Sources

IHSS Group NE-1 (Ponds B-1, B-2, and B-3) is in the RFETS northeastern BZ and receives flow from the central IA. A number of IHSS Groups are located within the area draining to the B-Series ponds. These IHSS Groups still require closure activities by ER or Decontamination and Decommissioning (D&D) and include the following:

- IHSS Group 000-2;
- IHSS Group 000-4;
- IHSS Group 100-1;
- IHSS Group 100-2;
- IHSS Group 400-7 (accelerated action underway; will be complete before B-Series ponds remediation begins);
- IHSS Group 500-3;
- IHSS Group 700-2;
- IHSS Group 700-3;
- IHSS Group 700-8;
- IHSS Group 800-3; and
- Seeps along Walnut Creek may also be a possible continuing source of VOC contaminants to the B-Ponds.

Demolition and any accelerated action activities at these IHSS Groups could be a potential source of contamination to the B-Series ponds. Most significantly, demolition and remediation activities at Buildings 776 and 777 (IHSS Group 700-3) pose a potential for radioactive contaminants to be transported to the B-Series ponds via water runoff from dust suppression operations during demolition. To minimize this potential, dust suppression water associated with the demolition activity will be collected in tanks and recycled. Erosion controls will be established and maintained at the boundaries of the building footprints through berms, wattles, or straw bales. Additionally, storm drains in the vicinity will be covered during the demolition activities. Management of the water is addressed in the Building 776/777 Closure Project Decommissioning Operations Plan (DOE 1999).

2.5.2 Surface Water Protection

Surface water protection includes the following considerations:

17

Is there a pathway to surface water from potential erosion to streams or drainages?

Yes. Sediment and soil contaminants from IHSS Group NE-1 (Ponds B-1, B-2, and B-3) could migrate to surface water. However, during remediation activities, all existing drainage from each pond will be blocked, thereby making any potential impact to surface water from sediment unlikely.

Do characterization data indicate there are contaminants in surface soil?

Yes. Existing sediment and soil data for IHSS Group NE-1 (Ponds B-1, B-2, and B-3) indicate activities of americium-241 and plutonium-239/240 exist that exceed RFCA WRW ALs.

Do monitoring results from POEs or Points of Compliance (POCs) indicate there are surface water impacts from the area under consideration?

Yes. The nearest RFCA POEs are GS10 (upstream of Pond B-1) and GS08 (downstream of Pond B-5) (Figure 1). GS08 receives flow from all of the B-Series ponds (although Ponds B-1 and B-2 are frequently pumped to North Walnut Creek) and treated effluent from the Eastern Collection Trench. Sample results for plutonium-239/240 and americium-241 have been measured above 0.15 picocuries per liter (pCi/L) at both of these monitoring stations. However, IHSS Group NE-1 (Ponds B-1, B-2, and B-3) receives water from a large part of the IA, and surface water quality at the monitoring stations cannot be attributable to any single IHSS Group. Although radionuclides are the only analytes to exceed WRW ALs in sediment and soil from Ponds B-1, B-2, and B-3, all PCOCs listed on Table 1 will be analyzed during confirmation sampling of the B-Series ponds.

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

Yes. IHSS Group NE-1 (Ponds B-1, B-2, and B-3) is located in an area subject to erosion in accordance with Figure 1 of RFCA (DOE et al. 2003).

2.5.3 Monitoring

Monitoring includes the following considerations:

Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

No. All contaminated RFETS groundwater discharges into the drainages and ponds. The Site plume location map (DOE 2002) indicates there is VOC contamination in groundwater southwest of the B-Series ponds, which is defined as the East Trenches Plume. Numerous wells are used to monitor groundwater both upgradient and downgradient of the East Trenches Plume Collection System. Groundwater quality data obtained from monitoring wells located downgradient of the collection trench and immediately upgradient of the B-Series ponds indicate concentrations of some VOCs are greater than Tier I ALs. However, upgradient of the trench, prior to capture and treatment, VOC contaminant concentrations have be reported at greater than 40 times the Tier I ALs.

18

The plume is attributable to multiple upgradient sources, i.e., the 903 Pad and East Trenches. The B-Series ponds are not a source of the East Trenches Plume. Further groundwater evaluation will be conducted as part of the groundwater plume remedial decision and future Sitewide evaluation.

Can the impact be traced to a specific IHSS Group?

No. Impacts to groundwater cannot be traced to IHSS Group NE-1 (Ponds B-1, B-2, and B-3). All sources are upgradient of the ponds.

Are additional monitoring stations needed?

Not applicable at this time. The need for and placement of monitoring stations will be re-evaluated in the Long-Term Stewardship Plan.

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable at this time. Existing wells monitor contamination from areas outside IHSS Group NE-1 (Ponds B-1, B-2, and B-3).

2.5.4 Stewardship Actions and Recommendations

The current stewardship actions and recommendations for IHSS Group NE-1 (Ponds B-1, B-2, and B-3) are as follows:

- Use best management practices (BMPs) to reduce erosion into surface water.
- Implement requirements of the BO for protection of the Preble's mouse habitat in the project area. See Appendix A of Attachment 1 for specific requirements.
- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following:
  - Restrict access; and
  - Control soil excavations through the Site Soil Disturbance Permit process.
- Implement long-term stewardship actions, including the following:
  - Prohibitions on construction of buildings in the area; and
  - Restrictions on excavations or other soil disturbances.
- Temporary surface water performance monitoring is recommended to be discussed as part of the Integrated Monitoring Plan (IMP) process

These recommendations may change based on in-process remediation activities and other future RFETS remediation decisions.

2.6 Accelerated Action Remediation Goals

ER RSOP remedial action objectives (RAOs) include the following:

- Provide a remedy consistent with the RFETS goal of protection of human health and the environment.

19

- Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls.
- Minimize the spread of contaminants during implementation of accelerated actions.
- Minimize disturbances to habitat in the area due to remediation activities.

2.7 Treatment

Not applicable at this time.

2.8 Project-Specific Monitoring

Air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations. Approximate locations of air samplers are shown on Figure 2; however, actual locations will be determined in the field.

2.9 Resource Conservation and Recovery Act (RCRA) Units and Intended Waste Disposition

Not applicable.

2.10 Future Plans

Reconfiguration plans of the B-Series ponds, such as dam notching and placing of fill material in the excavated areas, will be conducted in consultation with the EPA and U.S. Army Corps of Engineers under a separate project. These efforts will be implemented to ensure that the substantive requirements of Section 404 of the Clean Water Act are met.

2.11 Administrative Record Documents

DOE, 1992-2003, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.

DOE, 1996, Final Phase I RFI/RI Report, Walnut Creek Priority Drainage, Operable Unit 6, Rocky Flats Plant, Golden, Colorado, February.

DOE, 1999, Building 776/777 Closure Project, Decommissioning Operations Plan, Revision 0, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, RFCA Standard Operating Protocol for Recycling Concrete, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

20

2.12 Projected Schedule

Remediation of IHSS Group NE-1 (Ponds B-1, B-2, and B-3) is expected to begin in the first quarter FY05.

3.0 PUBLIC PARTICIPATION

ER RSOP Notification #04-11 activities were discussed with stakeholders and agencies on an October 19, 2004 status meeting. A Portable Document Format (PDF) version of this Notification was provided to the local governments. This Notification is available at the Rocky Flats Reading Rooms and on the Environmental Data Dynamic Information Exchange (EDDIE) Website at www.rfets.gov.

4.0 REFERENCES

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996, Final Phase I RFI/RI Report, Walnut Creek Priority Drainage, Operable Unit 6, Rocky Flats Plant, Golden, Colorado, February.

DOE, 1997, Annual Historical Release Report for the Rocky Flats Plant, Golden, Colorado, September.

DOE, 1999, Building 776/777 Closure Project, Decommissioning Operations Plan, Revision 0, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Second Quarter RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Automated Surface-Water Monitoring Report, Water Year 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

Attachment 1

B-Ponds Remediation Activities, Biological Evaluation Rev. 4,
Classification Exemption CEX-105-01

22

B-Ponds Remediation Activities
Biological Evaluation Rev. 4
Classification Exemption CEX-105-01

The B-Series Ponds are located in South Walnut Creek at the Rocky Flats Environmental Technology Site. The ponds have served as detention ponds for the past several decades. As part of the Site cleanup and closure activities, the sediments in Ponds B-1, B-2, and B-3, all three of which have elevated contaminant levels will be remediated. It is estimated that approximately 2 to 3 feet of the upper layer of sediment and soil will be removed from each pond. Contaminated material will be placed into waste containers, moved to a temporary staging area pending characterization, and shipped for offsite disposal. The project is being conducted as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) action and therefore wetland issues fall under the jurisdiction of the U.S. Environmental Protection Agency (EPA) per the requirements of the Memorandum of Agreement (DOE 1996). Current plans are to begin the work in late September/early October 2004.

The general description and sequence of the work activities necessary to complete the remediation of the B-Ponds (B-1, B-2, and B-3) is as follows:

- Build diversion ditches around ponds to prevent surface flow from entering ponds during project activities. A diversion ditch will be cut into the hillside north of the B-ponds along the length of the B-1, B-2, and B-3 ponds to prevent runoff from the hillside from reaching the ponds. The diversion ditch will have erosion controls installed to prevent runoff from the ditch itself and to slow water movement in the ditch. An additional ditch will be cut along the south edge of the road that runs parallel to the B-ponds. Erosion controls will be installed to slow water movement in the ditch.
- Pump surface water in B-1 into B-2.
- Pump combined B-1 and B-2 water from B-2 into A-2.
- Pump B-3 surface water to A-2 after B995 is closed.
- B-1 sediments mixed with portland cement to remove free water.
- Excavate de-watered soil in B-1 and place directly into waste containers for off-site disposal.
- B-2 sediments mixed with portland cement to remove free water.
- Excavate de-watered soil in B-2 and place directly into waste containers for off-site disposal.
- Mix sediments in B-3 with portland cement to de-water, excavate and place into waste containers.
- No fill material will be placed on the pond bottoms after remediation activities are completed, unless potholes exist in the pond bottom that must be filled to match the contour of the pond bottom. If surrounding material from the pond bottom is not sufficient to fill the potholes, additional fill material may be used. If used, it will consist primarily of silts and sands.
- Once final contouring is completed, revegetation using native plant species will be performed.

The sediment removal will take place to the high water mark or to where confirmation sampling indicates no further contaminants (i.e. below action levels). Sediment will be removed from the ponds using a sludge pump, excavator or similar equipment. Soil directly below the sediment will be excavated using an excavator or similar equipment. Sediments will be de-watered with reagent (portland cement) to remove free water prior to placing in waste containers. Debris will be removed if necessary and packaged in appropriate containers. Straw waddles, silt fence and/or straw bales will be used for erosion control. Temporary access roads may be constructed if necessary to access the pond bottom with construction equipment.

23

The wetlands in the area of the B-Ponds were delineated by the U.S. Army Corps of Engineers in 1994 as part of a wetland study at the Site (Figure 1; COE 1994). Table 1 below lists the wetland types present at each of the three ponds. Some additional seepage on the south side of the B-1 pond has created conditions where enough moisture has been present at or near the ground surface to support the growth of vegetation characteristic of wetter areas. These areas are dominated by arctic rush (*Juncus balticus*) and Canada thistle (*Cirsium arvense*).

Table 1. Temporary Wetland Impacts

Wetland Type	Acres
Pond B-1	
Palustrine Scrub-Shrub, Seasonally Flooded	0.02
Palustrine Emergent, Temporarily Flooded	0.07
Palustrine Unconsolidated Bottom, Semipermanently Flooded	0.50
Palustrine Emergent, Saturated	0.21
Palustrine Unconsolidated Bottom, Permanently Flooded	0.00
Total	0.80
Pond B-2	
Palustrine Emergent, Temporarily Flooded	0.20
Palustrine Emergent, Seasonally Flooded	0.19
Lacustrine Limnetic, Unconsolidated Bottom, Permanently Flooded	0.72
Total	1.11
Pond B-3	
Palustrine Scrub-Shrub, Seasonally Flooded	0.02
Palustrine Unconsolidated Bottom, Permanently Flooded	0.50
Palustrine Emergent, Temporarily Flooded	0.17
Palustrine Emergent, Seasonally Flooded	0.08
Total	0.70
Grand Total	2.61

The B-Series Ponds are located in the habitat of the federally listed threatened Preble's meadow jumping mouse (Preble's mouse; *Zapus hudsonius preblei*). The Preble's mouse and other threatened or endangered species issues have been addressed in Section 7 consultation with the USFWS in a Programmatic Biological Assessment (PBA; Parts I and II) written for Site closure activities (DOE 2004a, 2004b). The USFWS has issued a Biological Opinion (BO) covering the project activities outlined in this document (USFWS 2004; Appendix A).

Wetland impacts should be temporary because after project completion the ponds will be allowed to refill and the wetland vegetation will be re-established. Wetland re-establishment will not be conducted until another project, that will notch each of the dams at ponds B-1, B-2, and B-3, has been completed. Revegetation will occur after the notching since portions of the project footprints overlap. Then the areas will be revegetated using native plant species, either by seeding, staking, or using container plants, following the guidance and success criteria outlined in Part II of the PBA for Preble's mouse mitigation (DOE 2004b). Revegetation plans may be

24

integrated with the possible use of phytoremediation that may be used to slow further migration of the VOC plume in the valley fill alluvium on the south side of the B-Ponds (Groundwater IM/IRA).

The U.S. Department of Energy is notifying the EPA that wetlands at ponds B-1, B-2, and B-3, will be impacted as part of this project. The B-Pond remediation work is being conducted under the *Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification #04-011 IHSS Group NE-1 (Ponds B-1, B-2, and B-3).*

DOE. 1996. Memorandum of Agreement for the Administration of a Wetland Bank at Rocky Flats. . U.S. Department of Energy, Rocky Flats Field Office, Golden, CO. March 1996.

DOE. 2004a. Programmatic Biological Assessment for Department of Energy Activities at the Rocky Flats Environmental Technology Site. Part I. U.S. Department of Energy, Rocky Flats Field Office, Golden, CO. January 2004.

DOE. 2004b. Programmatic Biological Assessment for Department of Energy Activities at the Rocky Flats Environmental Technology Site. Part II. U.S. Department of Energy, Rocky Flats Field Office, Golden, CO. April 2004.

USACE, 1994. Rocky Flats Plant Wetland Mapping and Resource Study. (Prepared for U. S. Department of Energy), United States Army Corps of Engineers, Omaha District. December. 1994.

USFWS. 2004. Biological Opinion for Part II of the Programmatic Biological Assessment for Department of Energy Activities at the Rocky Flats Environmental Technology Site. U.S. Fish and Wildlife Service, Lakewood Office, Lakewood, CO. April 5, 2004.

25

Appendix A

Programmatic Biological Opinion
April 2004

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

April 5, 2004

IN REPLY REFER TO:
ES/CO: ES/LK-6-CO-04-F-012
Mail Stop 65412

Cliff Franklin
Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

Dear Mr. Franklin:

In accordance with section 7 of the Endangered Species Act (Act) as amended (16 U.S.C. 1531 et seq.) and the Interagency Cooperative Regulations (50 CFR 402), this is the U.S. Fish and Wildlife Service's (Service) final biological opinion on impacts to the federally-listed Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's) associated with Part II of the Programmatic Biological Assessment (PBA) for the Department of Energy (DOE) at Rocky Flats Environmental Technology Site (RFETS) located in Jefferson County, Colorado. Your request for formal consultation was received October 15, 2003. The revised PBA Part II with the additional information requested and the notification letter was received on January 20, 2004.

This biological opinion is based on information provided in Part II of the PBA provided on January 20, 2004 and the accompanying maps, telephone conversations, various meetings, field investigations, and other sources of information. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

DOE, Kaiser-Hill (K-H), and the Service began preliminary discussions about a PBA on June 4, 1998. Discussions about the benefits and the basic outline of contents for the PBA began on March 8, 1999. On July 12, 2000 the Service provided a letter of concurrence on a portion of the projects in the PBA- Part I containing projects with no effects, or projects that were not likely to adversely affect the Preble's mouse. The Service provided comments and requested information on the remaining projects provided by DOE in PBA-I where there was not concurrence. On August 1, 2002 the Service issued a biological opinion on the Water Measurement Flume Replacement Project (USFWS 2002) so that several deteriorated flumes could be replaced. Further discussion of the recommendations and non-concurrence activities was tabled until DOE

reinitiated consultation on the PBA on January 16, 2003. Revisions to the PBA draft were discussed by Service personnel, DOE and K-H on February 11, 20, 21, 24, and 27, 2003. Additional PBA revisions and comments for PBA-I were discussed April 29, 2003 and PBA-II comments were provided by the Service June 18, 2003.

A revised draft PBA was provided by DOE and K-H in October, 2003 for review. On December 18, 2003, the Service received a draft of Part I of the PBA incorporating the previously requested information and revisions along with a letter requesting concurrence by DOE. Part I was submitted separately to expedite the approval process of the activities addressed there while consultation continued on Part II of the PBA.

Species other than the Preble's mouse considered and determined to be not likely to be adversely affected in Part I of the PBA include:

Animals:	
American burying beetle (*Nicrophorus americanus*) *	Endangered
Bald eagle (*Haliaeetus leucocephalus*)	Threatened
Black-footed ferret (*Mustela nigripes*)	Endangered
Black-tailed prairie dog (*Cynomys ludovicianus*)	Candidate
Boreal toad (*Bufo boreas boreas*)	Candidate
Canada lynx (*Lynx candensis*)	Threatened
Eskimo curlew (*Numenius borealis*)*	Endangered
Greenback cutthroat trout (*Oncorhynchus clarki stomias*)	Threatened
Least tern (*Sterna antillarum*)*	Endangered
Mexican spotted owl (*Strix occidentalis lucida*)	Threatened
Mountain plover (*Charadrius montanus*)	Threatened
Pallid sturgeon (*Scaphirhynchus albus*)*	Threatened
Pawnee montane skipper (*Hesperia leonardus montana*)	Threatened
Piping plover (*Charadrius melodus*)*	Threatened
Whooping crane (*Grus americana*)	Endangered

Plants:	
Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*)	Threatened
Ute ladies' tresses orchid (*Spiranthes diluvialis*)	Threatened
Western prairie fringed orchid (*Platanthera praeclara*)*	Threatened

* Platte River species

In addition, no other species will be adversely affected by Part II activities.

BIOLOGICAL OPINION

This biological opinion is based on information regarding cumulative effects, conditions forming the environmental baseline, the status of Preble's, the importance of the project area to the survival and recovery of the species, and other sources of information as described below. The data used in this biological opinion constitute the best scientific and commercial information

currently available. This biological opinion addresses Part II of the PBA, which addresses activities that may affect and are likely to adversely affect the Preble's mouse.

DESCRIPTION OF THE PROPOSED ACTION

Project Location

The RFETS has been a nuclear industrial facility for the DOE since 1951. RFETS is located in Jefferson County approximately 5 miles southeast of Boulder and 16 miles northwest of Denver. The industrial area (IA) where manufacturing occurred covers about 400 acres of the site. The IA is surrounded by a 5,900 acre buffer zone (BZ), and Public open space lands lie to the west, north, and northwest borders. A housing development is currently located to the northeast, and another development is planned to the southeast. Several gravel mines and light industry sites are located on the western edge of the site. Approximately 750 acres of the western portion of the site are permitted for surface mining (Figure 1).

Project Site Description

Production of nuclear weapon components at RFETS stopped after the Cold War ended. In 1996, DOE, the Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) completed the Rocky Flats Cleanup Agreement (RFCA). The RFCA is the Federal Facility Compliance Agreement and Consent Order negotiated pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and the Colorado Hazardous Waste Act (CHWA). The RFCA provides the regulatory guidance for the accelerated cleanup and site closure to be completed by the end of 2006. After the cleanup is completed and the buildings and various other manmade structures have been decommissioned and demolished, a portion of the site will become the Rocky Flats National Wildlife Refuge.

Project boundaries and project actions have been described based on the best current information available. Project descriptions are based on worst case scenarios with the largest anticipated project disturbance size and impacts to the highest quality habitat included, except where specific plans or information currently exists. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types.

Due to the accelerated cleanup schedule, it is likely that a number of these projects will be conducted concurrently. These projects are being consulted on because they are likely, but not certain to take place and are within the Preble's protection area. The protection area is designated as a 300 foot zone extending in all directions around Preble's mice telemetry points. In addition, a 100 foot zone extending around suitable Preble's habitat areas without telemetry data is also included in the protection zone (Preble's Protection Plan, Appendix A of Part I of the PBA) (Figure 2). The area of Preble's habitat at the Site is 941.23 acres.

Description of Proposed Project Actions

Monitoring Well Installations

Additional wells may need to be installed site-wide to meet regulatory requirements for monitoring water quality and possible groundwater contamination during and after closure activities. Up to ten of these wells may need to be installed within the Preble's habitat area. Typically during installation, truck-mounted drill rigs will be driven to the well location to bore the well holes. A small amount of soil (1 cubic yard) from the well boring will be spread out in the adjacent vegetation. For the monitoring well installations, 405 square feet per well will be disturbed at an estimated ten different sites. This equates to a maximum disturbance total of 4,050 square feet (0.093 acres). Of the total 0.093 acres disturbed, a total of 0.09 acres will be temporary disturbances for all ten wells. A total of 0.003 acres will be permanently disturbed for all ten wells combined. After installation, the well would need to be monitored periodically for sample collection.

Additional disturbances could result from temporary two tracks becoming established from off-road driving where no established access roads exist. No impacts to water flows or increases in sedimentation are anticipated from this activity.

Original Landfill Project

The remediation plan for this project involves removing radiological hotspots and stabilizing the hillside slopes to prevent further erosion. The cleanup of the landfill is being conducted as a CERCLA action as required by the RFCA. Heavy earthmoving equipment will be used to complete this project. Large areas of the hillside may need to be scraped off and recontoured with additional fill material. The South Interceptor Ditch (SID) would be removed as part of the cleanup activity. The project area is about 20 acres in size and could impact a total of 9.10 acres of Preble's habitat, including 2.76 acres of high quality woody riparian habitat along several hundred feet of the north edge of Woman Creek. Most of the project is located in an old landfill vegetated with smooth brome (*Bromus inermis*), intermediate wheatgrass (*Elytrigia intermedium*), and diffuse knapweed (*Centaurea diffusa*). Although this disturbance will be temporary, the remediation work is expected to take several months to complete.

Pond Remediation and Removal

The ponds included in the remediation and removal project include A-1, A-2, A-3, B-1, B-2, B-3, B-4, in Walnut Creek, as well as the C-1, C-2 ponds and associated diversion and bypass structures found near the C-2 pond in Woman Creek. The project may also require the removal of the associated underground pipelines and valve boxes that are used to transfer water from one pond to another. These pipelines are typically buried adjacent to the pond edges and run between the ponds. Characterization of pond sediments may be conducted prior to remediation activities to determine the need for remedy. Characterization involves sampling the sediments on the pond bottoms either by foot or boat, depending on water levels. Remediation activities would include removal of contaminated sediments from the pond bottoms and stream channels. Pond removal activities may include removal of the dams and spillway structures and

recontouring the stream drainage and channel. Removal may also include breaching of the dams or leaving some type of lowhead dam structure in place to maintain the wetlands behind the dams. If the dams are not removed, then dam maintenance activities would need to continue indefinitely. Heavy equipment would be required for pond remediation or removal activities.

At the C-2 pond location, the Woman Creek bypass structure and diversion ditch that diverts water from the natural stream channel around the C-2 pond may be removed. The large riprap and concrete bypass structure in the creek channel above the C-2 pond may be taken out and the natural stream channel reestablished to allow the stream to flow into C-2. The diversion ditch may be filled in and recontoured to match the natural landscape. The outlet works for C-2 pond need to be redesigned to function properly to allow for water releases from the pond. If the bypass structure and diversion ditch are not removed, repairs to the riprap drop structures in the diversion ditch will be necessary to prevent further ditch erosion. In either case, future work activity would remain within the project boundary.

In the A-series ponds, a total of 14.82 acres of current Preble's habitat could be disturbed (Figure 2). In the B-series ponds, a total of 12.59 acres of current Preble's habitat could be disturbed (Figure 2). In the C-series ponds, a total of 9.99 acres of current Preble's habitat could be disturbed (Figure 2). In the A- and B-series ponds, impacts would be temporary. In the C-series, most of the work in the C-2 pond area would create temporary disturbances. However, approximately 1.87 acres in current Preble's protection areas would be permanently lost if the bypass channel and diversion ditch are filled in. The open surface area of the ponds has been subtracted from the total disturbance calculations because open water is not considered to be Preble's habitat. If the open areas of the ponds are converted to habitat suitable for Preble's through pond removal, higher quality habitat could be increased by 2.65 net acres.

Surface Water Monitoring Equipment Removal

Most of the old surface water monitoring instrumentation housings, concrete pads, posts, and signage will probably be removed as part of cleanup and closure. Although vegetation type, and the presence of the Preble's mouse varies by individual site, all of these structures are located within Preble's habitat in the Walnut and Woman Creek drainages. Existing roads or two tracks are used to access most of the locations, however some off-road travel may prove necessary. Some shrubs may need to be clipped so monitoring equipment can be removed. Heavy equipment may be needed for removal of larger structures. A maximum of 1.0 acre of temporary disturbance is anticipated to occur.

Surface Water Permanent Flume Installations and Replacement

Surface water flumes are used to monitor water flows and to obtain automated grab samples for contaminant analyses. Although there are no current plans to add or replace permanent flumes, it is possible that one flume may need to be replaced before site closure. Permanent flumes are large concrete structures that require the use of heavy equipment and up to three months to complete construction. Total disturbance area would be 0.5 acres in size, and would be temporary in nature. Because a new flume would be replacing a structure of the same size, no additional permanent impacts will result. Two deteriorated, permanent surface water flumes were replaced during 2002/2003 under a biological opinion provided by the Service in 2002.

Surface Water Flume Removal

Temporary and permanent surface water flumes have been used to monitor water flow and for automated grab samples for contaminant analyses. Several flumes that are no longer being used will be removed, in addition to several more where use will be discontinued before site closure. Established roads already exist for most of the flumes as they have been monitored for years.

Temporary flumes are small structures (12x3 feet) that are made of a fiberglass body, plastic sheeting wings, wooden beams, and sand bag anchors. These flumes would be dismantled by hand, and a vehicle used to haul off the components. The total temporary disturbance for the removal of temporary flumes is not expected to exceed .10 acres.

Permanent flumes are large concrete structures, and will require driving heavy equipment to the flume for removal, and a roll-off container or dump truck for hauling debris off-site. The total disturbance footprint for all of the flumes would not exceed 0.45 acres in size.

North Access Road and Culvert Removal Project

The north access road and some culverts are planned for removal as part of the IA regrading plan. Except for a small portion east of the north access road, most of the culverts and the road to be removed are not in the Preble's protection area. The roads will be removed by heavy earthmoving equipment, and will include asphalt removal and ripping of the roadbed before reseeding. Areas where culverts are removed will be recontoured as a stream channel. The total disturbance to Preble's protection areas will be 1.83 acres in lower quality habitat, and 0.23 in higher quality habitat.

Approximately 12 cement culvert sections that remain from an abandoned roadbed across the Woman Creek stream bottom may be removed as part of site cleanup operations. Culvert sections would be lifted by a crane or hoist and then placed on a truck to be removed from the area. A limited amount of off-road driving in mesic grassland will be necessary for crane access and staging. Some vegetation may be trampled from foot traffic as well. Temporary disturbance to 0.40 acres for lower quality habitat and 0.20 acres of higher quality habitat is anticipated for this activity. In the long term, successful revegetation and stream realignment in this area would restore Preble's travel corridors and reduce habitat fragmentation.

Dam Maintenance and Safety Activities

Dam safety inspections are conducted periodically throughout the year. The Federal Energy Regulatory Commission and the State of Colorado have requested that all vegetation obscuring visual inspection of the outlet area and upstream slopes be removed so that seepage from low-level pipes can be monitored throughout the year. Removal will involve mowing, hand clipping, and weed whacking on the dam toes, outlet works, and both interior and exterior dam faces. Affected dams within the Preble's protection area include the A-1– A-3, C-1, and B series ponds. These areas will be accessed on foot. A total of 3.16 acres of lower quality habitat, and 0.22 acres of higher quality Preble's habitat will be permanently disturbed.

B2

For safety reasons, additional riprap must occasionally be placed on dam faces or spillways to protect these structures and the downstream areas. Heavy equipment will be required for this work, but the equipment will remain on the dams or spillway areas and will not affect Preble's habitat.

Waste Water Treatment Plant (WWTP) Removal

The WWTP treats 150,000 gallons of site-generated non-hazardous, non-radioactive liquid, sanitary waste daily to meet National Pollutant Discharge Elimination System requirements. The waste is treated with activated sludge, tertiary clarification, sand filtration, and ultra-violet light disinfection, and then is released into South Walnut Creek through a pipeline. The treatment structure will be removed prior to site closure. Approximately one third of the WWTP lies within the Preble's habitat protection area boundary. The WWTP buildings and parking lots are not considered to be suitable Preble's habitat, however some reclaimed grassland and riparian vegetation just to the south may be disturbed in conjunction with the North Access and Culvert Removal project described previously. The WWTP removal project is expected to disturb 0.28 acres of roads, parking, and building areas (See PBA Figure 2 map.).

Platte River Water Depletions and Preble's Mouse Water Reduction Issues

Cessation of the release of Waste Water Treatment Plant (WWTP) effluent into Walnut Creek is not considered to be a depletion of the Platte River system. Further, discontinuing the purchase of water from the Denver Water Board that is currently used for sanitary needs by on-site personnel, and the removal of impervious surfaces and returning them to a more natural state also do not constitute a depletion according to current Service policy (Don Anderson, personal communication, 2004).

However, these closure activities will have an impact on Preble's mouse habitat in the Walnut Creek drainage. A Site-Wide Water Balance (SWWB) modeling study provides an estimation of changes in surface and subsurface hydrology at the Site. Results from the model indicate substantial changes in the hydrology of Walnut Creek. Walnut Creek discharges decreased for the following three reasons: (1) WWTP contributions to Walnut Creek were eliminated; (2) impervious surfaces in the Industrial Area (IA) were removed, thereby eliminating fast runoff and increasing the amount of surface water infiltration in the IA; (3) building drain discharges to IA streams were eliminated. Potential effects of these changes are discussed in the biological assessment.

Based on the SWWB (K-H 2002b), under the No Imported Water Scenario, modeled off-Site surface discharge in Walnut Creek decreased from about 800,000 m^3/year to 510,000 m^3/year in wet years, and from 450,000 m^3/year to 190,000 m^3/year in dry years. Under the Land Configuration Scenario, off-Site surface discharge in Walnut Creek decreased from approximately 800,000 m^3/year to 180,000 m^3/year in wet years. In dry years the modeling showed a decrease from 450,000 m^3/year to 20,000 m^3/year. The Land Configuration Scenario described the combined effect of no imported water in addition to reduced water from surface water flows in the IA. Overall reductions of water flow at the Site boundary in Walnut Creek are estimated to range from about 78 percent in wet years to about 96 percent in dry years.

Additionally, the study showed that in Woman Creek, surface flows exiting the Site near Indiana Street will be largely unaffected by changes resulting from site closure activities. Wet year or dry year water flows remained at about 200,000 m^3/year during wet years, and at slightly below 100,000 m^3/year in dry years. Upstream of the C-2 pond no changes in surface flows are expected as a result of IA cleanup and closure actions because currently no water reaches the stream from the IA due to its diversion through the South Interceptor Ditch (SID). Although runoff in the SID basin is expected to decrease as a result of changes in the IA, no discharges were predicted for Pond C-2 in any of the scenarios modeled. As a result, little change should occur in Woman Creek flows.

No changes are anticipated in the Rock Creek drainage as a result of closure activities because this watershed is isolated from the IA closure activities.

Unforeseen Projects Inside Current Preble's Protection Areas

To avoid possible work delays, there potentially could be an additional 2 acres of disturbance in Preble's habitat resulting from unforeseen project activities that would adversely affect the Preble's mouse. These activities could cause a permanent loss of habitat of 0.25 acres maximum. Any use of the two-acre allotment will be documented and the pertinent information provided to the Service.

Conservation Measures

Actions in the project description that the project proponent will implement to reduce impacts of the action or further the recovery of threatened and endangered species are known as conservation measures. As part of the proposed action, the beneficial effects of these conservation measures are taken into consideration in the jeopardy and incidental take analyses. Conservation measures are part of the proposed action and their implementation is required under the terms of this consultation. Specific conservation measures identified in the biological assessment and included in this biological opinion that will benefit threatened and endangered species are detailed in the following section.

General Measures and Best Management Practices (BMPs)

1. Identify and prioritize Preble's habitat areas that are subject to disturbance and design activities to avoid areas of higher habitat value. For example, large willow patches will be avoided, except where the project cannot be completed without impacts.
2. Reduce the impact footprint (i.e., no walking in area beyond what is necessary to accomplish the work, minimizing laydown area and equipment storage locations).
3. Conduct activities during daylight hours, when the Preble's mouse is less active, when scheduling during the hibernation season of the mouse cannot be accomplished.
4. Minimize the length of time spent in sensitive areas (getting work done as quickly as possible, and not reentering the area once work is completed).
5. Explore options with project designers to avoid and/or minimize impacts to the Preble's mouse.
6. Use established roads (i.e., paved, gravel, two-track, historically-used routes to monitoring locations) for vehicle traffic. If an established road does not exist, use the

safest and most direct route that minimizes impacts to the habitat and has been predetermined by an entity familiar with Preble's habitat use.

7. Limit equipment entrance/exit areas to the minimum number necessary to accomplish the work.
8. Limit vegetation disturbance through alternative actions. For example, prune trees/shrubs rather than remove trees/shrubs; cut shrub stems to allow re-growth rather than grubbing out the entire root system.
9. Remove trash and unnecessary equipment in project areas after work is completed.
10. Revegetate all disturbed Preble's habitat with suitable native species at 2:1 ratio in higher quality habitat, 1.5:1 in lower quality habitat, after the activity has been completed. Refer to Table 1 and the Habitat Mitigation Techniques Plan (Appendix A, Part II of the PBA).
11. When revegetation activities cannot be completed immediately after project completion (i.e., outside optimum seeding window) use alternative erosion controls to control potential erosion and sedimentation problems. Use redundant erosion controls where appropriate.
12. Utilize erosion controls (i.e., silt fence, erosion blankets, hay bales, mulching, tackifiers, surface roughening) on all appropriate cleanup projects to control erosion and sedimentation problems. Utilize photo or biodegradable erosion blankets that will not entangle Preble's and other wildlife. For large areas, minimize exposed surfaces. Project personnel will be responsible to monitor erosion control effectiveness and modify control techniques as needed (especially after precipitation events). Monitoring will be conducted weekly or more frequently as needed (after precipitation events). Projects will maintain and repair erosion controls through project completion.
13. Monitoring of mitigation actions will be conducted according to the Mitigation Monitoring Plan (Appendix B of Part II of the PBA).
14. Prevent spilled fuels, lubricants or other toxic materials from entering Preble's habitat through the use of spill containment devices.
15. Minimize project activities in wet areas and wet conditions to avoid damage to the habitat.
16. Use the least amount of and/or smallest equipment necessary to accomplish the work.
17. Do not clean equipment in Preble's mouse habitat or in areas where runoff will enter Preble's mouse habitat.
18. Staging areas will be located either outside of Preble's habitat, or within the defined project footprint.
19. Do not use Preble's mouse habitat as borrow areas.
20. Inspect and clean equipment of weeds/seed to prevent the spread of noxious weeds to other locations.

Activity Specific Measures

Monitoring Well Installations

1. Excavated soil from bore holes will be spread out on the surrounding area to a depth of less than 1" to avoid burying vegetation.

Original Landfill Project

1. If construction will likely occur during the hibernation period (October – April), trim back and prune woody vegetation where practicable within Preble's habitat the previous August.

2. Retain woody root systems where remedy regulation guidelines permit.

3. If the alteration of stream flows becomes necessary, or excessive sedimentation, as evidenced by visible plumes in the stream, occurs in riparian habitat outside of the project footprint, the Service will be notified, and sediment control methods will be re-evaluated. Additionally, if rills or gullies occur in graded areas, the Service will be notified, and erosion control methods will be re-evaluated.

Pond Remediation and Removal

1. If construction will likely occur during the hibernation period, trim back and prune woody vegetation where practicable within Preble's habitat the previous August.

2. Retain woody root systems where remedy regulation guidelines permit.

3. Revegetate areas of pond removal with appropriate mesic or wetland native plant species.

4. Maintain redirected stream flows when de-watering of the ponds is necessary during remediation activity.

5. Contour disturbed areas to match surrounding areas.

Surface Water Flume Removal

1. Contour disturbed areas to match surrounding areas.

North Access Road and Culvert Removal Project

1. Alleviate compaction of roadbed areas before seeding operations through ripping, plowing and or discing to a minimum depth of 24 inches to allow successful revegetation.

Additional details of proposed conservation measures are provided in the PBA Part II, Preble's Protection Plan, Revegetation Plan Revision 2, and other materials.

Status of the Species/Critical Habitat

Preble's is a small rodent in the family Zapodidae and is 1 of 12 recognized subspecies of the species *Z. hudsonius*, the meadow jumping mouse. Preble's is native only to the Rocky Mountains-Great Plains interface of eastern Colorado and southeastern Wyoming. This shy,

largely nocturnal mouse lives in moist lowlands with dense vegetation. Adult Preble's are up to 8 to 9 inches long (its tail accounts for 60 percent of its length) with hind feet adapted for jumping. Preble's hibernate underground from September to May.

Records for Preble's meadow jumping mouse define a range including Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld counties in Colorado; and Albany, Laramie, Platte, Goshen, and Converse counties in Wyoming (Krutzsch 1954, Compton and Hugie 1993). Armstrong et al. (1997, p. 77) described typical Preble's meadow jumping mouse habitat as "well-developed plains riparian vegetation with relatively undisturbed grassland and a water source in close proximity." Also noted was a preference for "dense herbaceous vegetation consisting of a variety of grasses, forbs and thick shrubs." Shenk (2000) conducted radio tracking studies at three sites and document greater use of upland habitats than previously assumed.

Preble's has undergone a decline in range and populations within its remaining range have been lost. Habitat loss and fragmentation resulting from human land uses have adversely impacted Preble's populations. David Armstrong (University of Colorado, 1998) concluded that the meadow jumping mouse, in this region as elsewhere, is a habitat specialist, and that the specific habitat on which it depends is declining.

Compton and Hugie (1993, 1994) cited human activities that have adversely impacted Preble's meadow jumping mouse including: conversion of grasslands to farms; livestock grazing; water development and management practices, and, residential and commercial development. Shenk (1998) linked potential threats to ecological requirements of Preble's meadow jumping mouse and suggested that factors which impacted vegetation composition and structure, riparian hydrology, habitat structure, distribution, geomorphology, and animal community composition must be addressed in any conservation strategy.

Residential and commercial development and associated infrastructure, including highway and bridge construction, and instream alterations to implement flood control, directly removes Preble's meadow jumping mouse habitat, or reduces, alters, fragments, and isolates habitat to the point where Preble's meadow jumping mouse can no longer persist. Corn et al. (1995) proposed that a 100 meter (328 foot) buffer of unaltered habitat be established to protect the floodplain of Monument Creek from a range of human activities that might adversely affect Preble's or its habitat. Roads, trails, or other linear developments through Preble's habitat may act as barriers to movement. Shenk (1998) suggested that on a landscape scale, maintenance of acceptable dispersal corridors linking patches of Preble's habitat may be critical to its conservation.

Further information about the biology and status of the Preble's can be found in the report "Conservation Assessment and Preliminary Conservation Strategy for Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)" (Shenk, 1998, available on request).

Environmental Baseline

Preble's mice have been captured in all of the site's major drainages: Rock, Woman, North and South Walnut Creeks. Although the habitat quality varies widely, all of the drainages contain the

dense herbaceous understory, shrubbery, and open overstory associated with Preble's habitat. Introduced and noxious plant species are also present in all of the drainages despite intense site-wide weed control efforts. Previous trapping and telemetry studies indicate that these riparian areas are extensively utilized by Preble's for feeding, nesting, breeding, dispersal, and/or hibernation. There are approximately 941.23 acres of Preble's habitat at the Site.

Preble's have been captured near the A-series ponds above the A-3 pond, B-series ponds above the B-5 pond, and adjacent to the C-series ponds above and below the C-1 pond, between the C-1 and C-2 ponds, but not below the C-2 pond or in the diversion ditch around C-2. In the pond areas, habitat consists of open water ponds surrounded by short and tall marsh habitats along pond edges, and grasslands in the surrounding upland areas. At some locations upstream and downstream of the ponds and dams themselves, coyote willow, plains cottonwood, and false indigo are commonplace. No mice have been trapped downstream from the C-2 pond, possibly due to the more xeric conditions and lack of a significant shrub vegetation layer.

The xeric tallgrass prairie, tall upland shrubland, wetland, and Great Plains riparian woodland vegetation types present on-site have been identified by the Colorado Natural Heritage program as increasingly rare and unique (Figure 3).

EFFECTS OF THE ACTION

For determination of impacts to Preble's habitat, habitat quality was defined based on the 1996 Site vegetation map that was used to produce the current Preble's protection plan map. Using the Site's Geographic Information System (GIS), project footprints and the current Preble's protection area GIS coverages were overlain to determine the amount of area specific projects might impact in Preble's habitat. With this information, the 1996 vegetation map was used to identify different plant communities and habitat types within the potentially affected Preble's habitat. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat was defined to include all grassland classifications, mud flats, and other disturbed community types. Open water, riprap, concrete, roads, and structures were not considered habitat for the Preble's mouse. This information was used in the GIS effort to calculate the total number of acres of potential temporary and permanent impacts to both lower and higher quality habitat within project footprints. Any areas where additional riprap, concrete, roads, or structures are placed in the future will be considered as permanent habitat loss for Preble's.

Table 1. Anticipated effects of cleanup actions to Preble's habitat.

Project	Temporary (Acres)		Permanent (Acres)		Location/ Drainage	Total Disturbance (Acres)
	Habitat Type		Habitat Type			
	Low*	High+	Low	High		
Monitoring Well Installations	0	0.09	0	0.003	Various	0.09
Original Landfill	6.34	2.76	0	0	Woman Creek	9.1
Pond Remediation						
A Series	11.5	3.07	0	.25	Walnut Creek	14.82
B Series	10.48	1.78	0	.33	Walnut Creek	12.59
C Series	6.65	2.05	0.98	.31	Woman Creek	9.99
PondsTotal	28.63	6.9	0.98	.89		37.4
Surface Water Monitoring Equipment Removal	0	1.0	0	0	Walnut and Woman Creek	1.0
Surface Water Permanent Flume Installations/ Replacement	0	0.5	0	0	Walnut and Woman Creek	0.5
Surface Water Permanent Flume Removal	0	0.55	0	0	IA/Walnut, Rock, Woman Creek	0.55
North Access and Culvert Removal	2.23	.43	0	0	Walnut Creek	2.66
Dam Maintenance	0	0	3.16	0.22	Walnut and Woman Creek	3.38
Waste Water Treatment Plant						
Unforeseen Projects	0	1.75	0	0.25	Various	2.0
TOTAL	37.2	13.98	4.14	1.36		56.68
MITIGATION TOTAL	55.8	27.96	6.21	2.72		92.69

* Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types. A 1.5:1 mitigation ratio will be used in this habitat type. For determination of impacts within current Preble's protection areas, habitat quality was defined based on the 1996 site vegetation map.

+ Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. A 2:1 mitigation ratio will be used in this habitat type

Activities in Part II of the PBA will disturb 56.7 acres of Preble's habitat in total. This accounts for approximately 6.0 percent of total existing Preble's habitat on the Site. Of this area, 51.2 acres (5.4 percent of the existing habitat) could be temporarily affected and 5.5 acres (0.6 percent of the existing habitat) could have permanent impacts to habitat. Preble's individuals may be taken due to construction and/or restoration, enhancement, and/or revegetation efforts within their habitat. Additional take is expected to result from indirect effects due to habitat modification and destruction.

Secondary impacts of the proposed projects to Preble's may include temporary increases in noise, light, dust, stormwater runoff and sedimentation, pollution, disruption of travel corridors, and human activities related to the normal implementation of the project activities in the PBA.

The removal of the north access road, associated culverts, and buildings along with the creation of a section of new stream reaches to connect drainage areas will restore travel corridors and potentially add approximately 41 acres of suitable habitat upon subsequent revegetation.

Project sites that involve the removal of buildings, roads, riprap, and structures will be revegetated with native species, eventually resulting in an improved, more natural state for Preble's and other wildlife. Higher quality Preble's habitat will be revegetated at a 2:1 ratio of mitigation acres to potential impact acres. Lower quality areas will be revegetated based on a 1.5:1 ratio.

The final approval of acreages credited as appropriate and successful mitigation for impacts to Preble's mice will be determined by the Service.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action, including the possible development of new section of the 470 highway corridor nearby, are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Substantial development is occurring in Jefferson County. Various development projects are planned adjacent to RFETS, both upstream and downstream from the project site. While development in other areas of Jefferson County that contain Preble's habitat may undergo section 7 review, others may not. In the latter case, projects would be required to pursue Habitat Conservation Plans (HCPs) and section 10 permits where take of Preble's is likely. Jefferson County and other local jurisdictions are in the process of developing a county-wide HCP for Preble's. It is not clear how a county-wide HCP, if approved, will affect future development that may impact Preble's. However, the Service is required to conduct internal section 7 review of issuance of section 10 permits that may result from these HCPs. Future development in the area may result in a variety of direct and secondary impacts to Preble's and its habitat.

CONCLUSION

After reviewing the current status of Preble's, the environmental baseline for the action area, the effects of the proposed development and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of Preble's. Approximately 0.6 percent of existing Preble's habitat at RFETS will be permanently affected, and approximately 5.4 percent will be temporarily affected by the proposed activities.

Although the proposed projects will adversely affect Preble's and its habitat at RFETS in the short term, conservation measures and BMPs will avoid jeopardy to the species. Critical habitat was not designated in the project area, therefore none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by DOE so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The DOE has a continuing duty to regulate the activity covered by this incidental take statement. If the DOE (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

Amount or extent of take anticipated

The Service anticipates incidental take of Preble's through direct killing and by loss of food, cover, and other essential habitat elements. This take will be difficult to detect because of their small size and hibernation underground. The Service anticipates that the proposed action will result in incidental take of an undetermined number of Preble's individuals through both direct take and through habitat destruction, due to the temporary loss of 51.2 acres of Preble's habitat, and the permanent loss of 5.5 acres of Preble's habitat for a total of 56.7 acres.

In this biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure(s) are necessary and appropriate to minimize impacts of incidental take of Preble's:

1. The DOE will monitor the extent of habitat impacted to ensure that it does not exceed the authorized area or the authorized take limits.

2. The DOE will require timely revegetation and enhancement of the project area, as described in the conservation measures and project descriptions, to minimize the disturbance to Preble's habitat.

3. The DOE will ensure that mitigation efforts are successful in protecting, restoring, and enhancing Preble's habitat and report on its progress.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the DOE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are **non-discretionary**.

1. To implement Reasonable and Prudent Measure #1, the DOE shall:

   a. Ensure that BMPs designed to minimize take are implemented and are successful, including those for revegetation and erosion control.

   b. Ensure that Preble's habitat not designated for remedy, construction or restoration actions will be marked off with erosion barrier or other appropriate fencing to prevent inadvertent impacts to habitat outside the project footprint.

   c. Collect geospatial data on the actual footprint of disturbance after the activity is completed.

   d. Ensure that workers on-site will be informed about the reason for and importance of limiting disturbances and impacts to Preble's habitat outside of the fenced work areas.

2. To implement Reasonable and Prudent Measure #2, the DOE shall:

   a. Ensure seeding is completed as soon as the planting windows/timeframe allows.

3. To implement Reasonable and Prudent Measure #3 above, the DOE shall:

a. Conduct monitoring of restoration and enhancement efforts, which shall include photographs, geospatial data, spreadsheets, and other necessary information to determine the extent and effects of construction and the implementation and effectiveness of such efforts, until success criteria as defined in Appendix B of the PBA Part II are met. Reports of this information shall be forwarded to the Service after each growing season and prior to December 1.

b. Monitor habitat restoration and enhancement areas for a minimum of three growing seasons, and until such time as DOE and the Service determine that the required restoration and enhancement have met the success criteria (PBA Part II, Appendix B, Mitigation Monitoring Plan). If supplemental irrigation of habitat restoration or enhancement vegetation is provided, success shall be assessed by the Service only after at least two growing seasons without supplemental irrigation.

c. Ensure implementation of habitat restoration and enhancement is supervised by an entity experienced in reclamation or habitat restoration.

d. Continue to implement weed control efforts site-wide to prevent the further spread of noxious weeds.

4. To implement all Reasonable and Prudent Measures (#1 through #3) DOE shall:

a. Provide advance notice to the on-site Service representative on project activities planned for the upcoming week in Preble's habitat areas.

b. Provide access for inspection at any time by the on-site Service representative, with the proper accommodations made for any safety requirements for the work site.

c. Provide notification upon initiation of disturbance resulting from project activities to the on-site Service representative.

d. Provide notification of final sign-off on project activities in Preble's habitat areas to the on-site Service representative.

e. Provide updated Preble's Mouse Mitigation Debit/Credit Spreadsheet (PBA Part II, Appendix G) information as projects and mitigation efforts are completed on a monthly basis to the on-site Service representative.

f. Develop an adaptive management strategy with assistance from the Service for changes on RFCA requirements and site conditions.

5. Develop an adaptive management strategy with assistance from the Service that will address the potential habitat loss due to hydrologic changes in the Walnut and Woman Creek drainages. Such a strategy will describe how habitat will be measured, how loss

will be determined, and the steps that will be taken to compensate for that habitat loss, should it occur.

6. In the unlikely event that a Preble's mouse is encountered (dead, injured, or hibernating) during construction activities, the Colorado Field Office of the Service will be contacted at (303) 275-2370 immediately.

The Service believes that no more than 56.7 acres of Preble's habitat will be adversely affected as a result of the proposed action. The reasonable and prudent measures, with their terms and conditions of implementation, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The DOE must immediately provide an explanation of the causes of the take exceedences and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommendations are as follows:

1. Provide Preble's habitat enhancement through the Service-facilitated negotiations on the procurement of a conservation easement on the grazing rights, and by fencing the riparian corridor and adjacent pastures for conservation grazing, (in Section 16) to enhance approximately 144 acres of riparian habitat in the headwaters of Woman Creek.

2. Remove non-terminal ponds, dams and current spillway structures in the Walnut and Woman Creek drainages, leaving some type of lowhead dam structure in place to maintain the wetlands in place behind the dams. Recontour the stream drainage and channel to a more natural alignment to mitigate the possible effects on Preble's from decreased water flow in the Walnut Creek drainage.

3. Minimize the amount of riprap used for streambed stabilization; utilize alternate methods such as check dams and lowhead structures to control water flow and erosion to create more suitable Preble's and wildlife habitat.

4. Obtain the surface mineral mining rights in Section 9 in the west spray field to maintain the integrity of headwaters of Walnut Creek and enhance suitable habitat downstream.

5. Re-seed areas currently being mowed for dam maintenance activities with lower height native species such as blue grama, and western wheatgrass that will not require frequent mowings.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If the Service can be of further assistance, please contact Amy Thornburg at (303) 966-5777.

Sincerely,

FOR Susan C. Linner
Colorado Field Supervisor

cc: Dean Rundle, USFWS
Andrew Rosenman K-H
Jody Nelson, PEG

Thornburg, PBAII/ESRF/3/25/04

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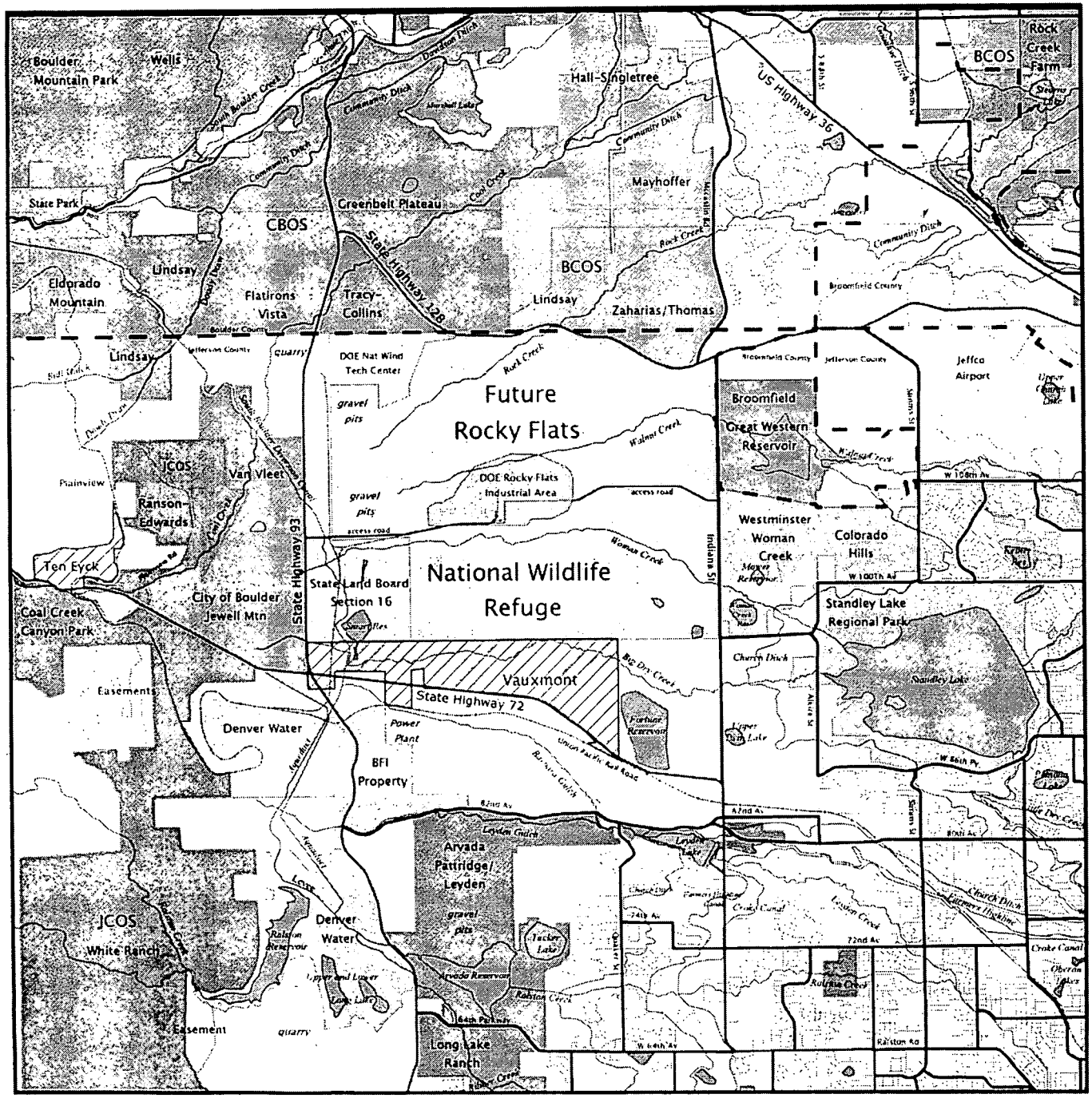


NJAG

Figure 1

Map of Open Space and Natural Lands

Open Space

- Rocky Flats
- Boulder County
- Jefferson County
- Arvada
- City of Boulder
- Broomfield
- Westminster

Other Open Lands

- BFI Property
- Conservation Easements
- Denver Water
- Nat Wind Tech Center
- State Land Board

Note: Transparent colors in map may vary from those in legend.

Other Features

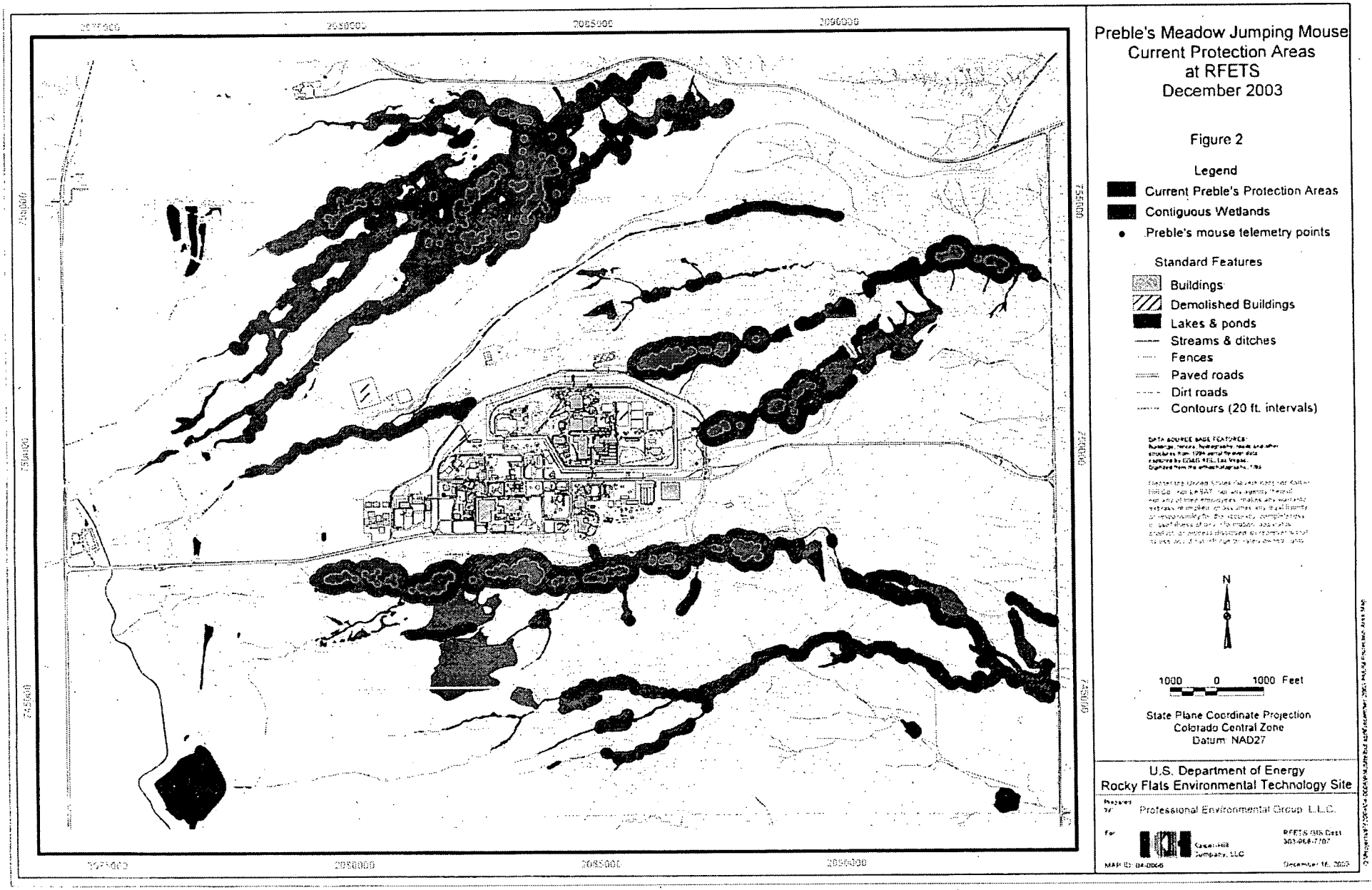
- Highways
- Major Roads
- Local Roads
- RailLines
- Streams and Gulches
- Lakes and Reservoirs
- County Boundaries
- Proposed Development

Miles

0 0.5 1 2

N

North Jeffco Area Group
Version 1.0, April 2002
8.5" x 11" Format
1:84,000 Scale
State Plane Coordinates
Central Zone, NAD 1927
For reference only.
Locations are approximate.


2078000
2080000
2082000
2084000
755000
753000
751000
749000
Preble's Meadow Jumping Mouse
Current Protection Areas
at RFETS
December 2003
Figure 2
Legend
Current Preble's Protection Areas
Contiguous Wetlands
Preble's mouse telemetry points
Standard Features
Buildings
Demolished Buildings
Lakes & ponds
Streams & ditches
Fences
Paved roads
Dirt roads
Contours (20 ft. intervals)
N
1000 0 1000 Feet
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27
U.S. Department of Energy
Rocky Flats Environmental Technology Site
Prepared by: Professional Environmental Group, L.L.C.
for
RFETS GIS Dept
303-966-7707
December 16, 2003

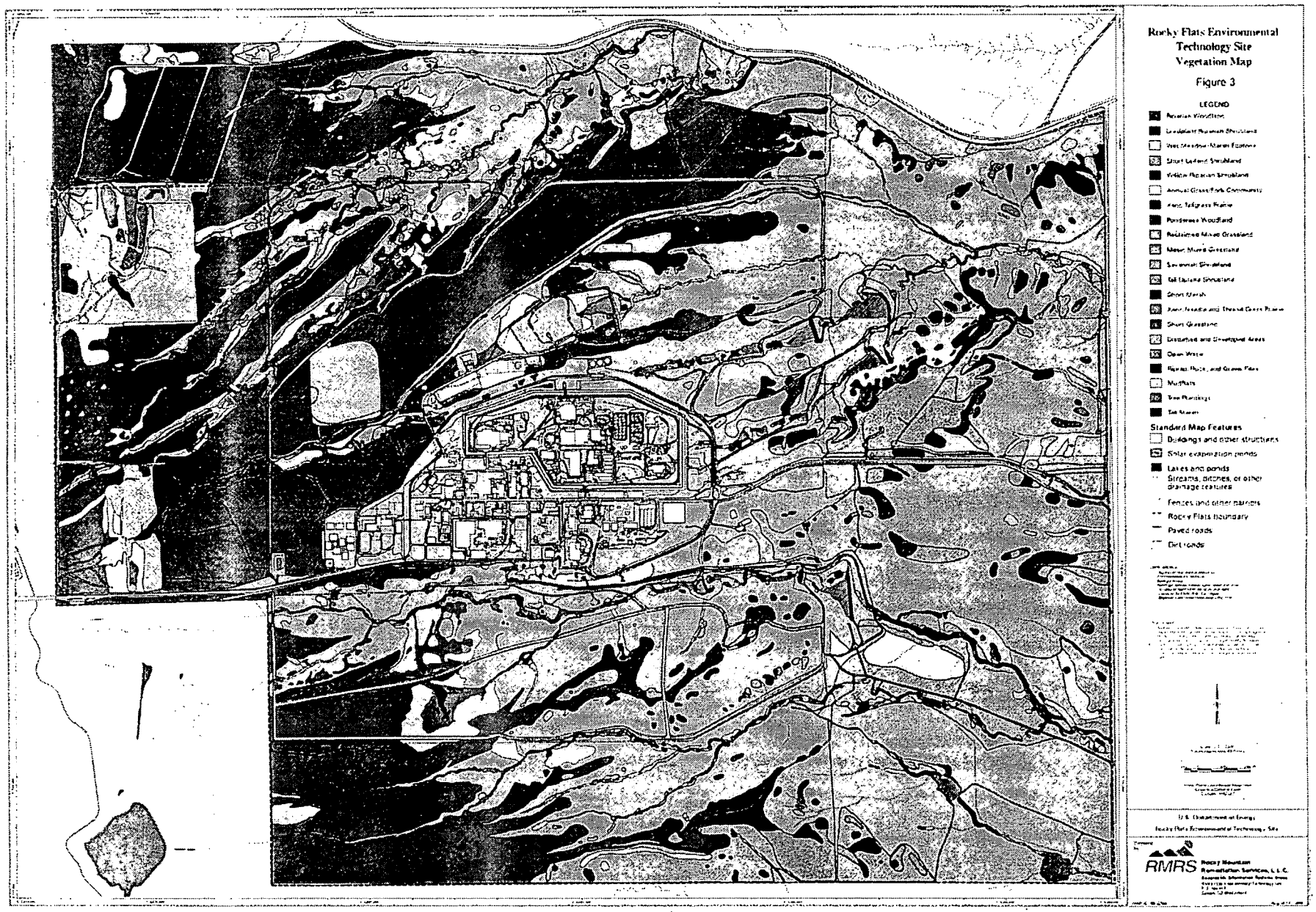

Rocky Flats Environmental Technology Site
Vegetation Map
Figure 3
LEGEND
Standard Map Features
Buildings and other structures
Solar evaporation ponds
Lakes and ponds
Streams, ditches, or other drainage features
Fences and other barriers
Rocky Flats boundary
Paved roads
Dirt roads
RMRS

Figure 3

IHSS Group NE-1
Ponds B-1, B-2, and B-3
Existing Sediment Sampling Results Greater than MDLs/RLs
or
Background Means Plus Two Standard Deviations

KEY

- Detected Above WRW Action Level
- Detected Below Action Level
- Below Background or MDL/RL

- Demolished Structure
- Structure
- Asphalt
- Dirt Road
- Lake
- Stream

2082000 2084000 2086000 2088000 2090000 2092000

754000 752000 750000 748000 746000

Pond B-1 Pond B-2 Pond B-3 Pond B-4

N W E S

400 0 400 800 Feet

Scale 1:5,750

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: RADMS

Date: October 2004

Prepared for: KAISER•HILL COMPANY

File:W:\Projects\fy2004\NE-1\remediation\b123ponds032904gpp.apr